

TRANS: THREE-DIMENSIONAL COMPUTER TECHNOLOGIES IN MILLINERY; TRANSITION, TRANSLATION, AND TRANSFORMATION

AUTHORS

Barton, Margo
Otago Polytechnic, Dunedin, New Zealand

Corresponding Author: margob@op.ac.nz

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ABSTRACT

This practice led research examines the use of three-dimensional computer technologies and approaches to sketching and developing millinery ideas over a series of experiments. The aim was to explore how traditional practices of paper and cloth in millinery can transition and be transformed using the technologies. The research is situated in the field of millinery, a subset of the discipline of fashion. Millinery is core to this design practice, with the distinctly sculptural aspects of millinery designing and making having structural aspects that link to other art and design practices.

Through a series of digital and analogue experiments, using a selection of fashion and non-fashion softwares, and an autoethnographic approach I sought to discover how I could use three-dimensional computer technologies for designing millinery; not just to make hats, but to explicate the sketching and design process that leads to them. Through a process of critical reflection on my practice, and the practices of others, and associated literature, I have come to understand that the adaptation of the practices of designing and sketching cannot be isolated and are not a simple act of transition or translation across mediums. Rather, this research shows, that the practices of designing and sketching are dialogic; there is an on-going exchange between designer, materials and methods, never in isolation. As I transition into the space of three-dimensional softwares, the material practices of the hand on paper continue to inform and transform what is known, made and discovered within the framework of an evolving and unpredictable practice.

By utilizing technologies from various domains, including fashion, as tools for sketching, designing, simulating and making millinery concurrently, I explored and critiqued the practices of millinery as a design practice beyond the realm of hat making.

Through this research I encourage transdisciplinary approaches to designing, and signal that if technology can be used in novel ways, then the output is also novel, not predictable, and therefore could be a post human practice as defined by Pepperell.

INTRODUCTION

The aim of this paper is to communicate findings from a designing practice that straddled a unique time in history

when fashion, and history, moved from a purely physical - practice and product and to start to encompass nonphysical practices, and products.

Through reflection, and re-reflection (Schön, 1983), I outline unique experiences that occurred as we move towards increasingly computer dominated design practices.

The objective of this paper is to encourage practitioners to take risks and utilize ways of working outside their disciplines, as this could transform their practices.

This paper is the result of a systematic process of reflection and re-reflection on a series of experiments using computer technologies and other three-dimensional methods for designing fashion, and later millinery. The subsequent narrative focuses on the learnings gained.

I selected some key experiments from early 2000's, and re-reflected on my lived experiences, (van Manen, 1997), with the aim of gaining a deeper understanding of the practice of designing in three dimensions, whether in a physical or digital space. My aim was that re-reflection following a period of time could result in new understandings about designing in three dimensions, that could be of use to me, other designers and researchers, and as information to communicated to my ākonga (students). I gained much more than a deeper knowledge of designing in three dimensions.

A TIME AND A PLACE.

To understand this journey, it is important to understand the point in time, and the motivation.

It was late 1981, Surry Hills, Sydney, Australia, and after working as a pattern grader in New Zealand and then Australia for four years, I visited a well-known fashion recruitment agency to enquire about a new position. I was informed that computer technology for fashion was invented, that this technology would change the world of fashion, and that my future career options would be non-existent in the not-so-distant future. I was advised to forget being a pattern grader, and to apply for fashion design school at Fashion Design Studio, East Sydney Technical College. I did. I went on to love my time studying fashion design, and to also have a successful career as a designer and milliner, fashion lecturer, often drawing on my experience as a pattern grader.

The possibly ill-informed but potentially insightful statement in 1981 sat in the back of my mind for decades. I imagined a complex machine, that worked in three dimensions, like my designerly mind, that was entirely different to the usual two-dimensional paper patterns.

It was not until the mid-1990s when the School of Fashion, Otago Polytechnic, Dunedin, New Zealand purchased fashion patternmaking software that I realized that the fashion computer technology was two dimensional.

What was the point of computers for fashion? Computer aided patternmaking replicated physical practices I had undertaken in my early career on paper, and besides the obvious - easy to transmit across the seas, and easier to store, quicker to grade patterns - there was then no three-dimensional option, and I noted that a person with knowledge of pattern grading was and is required. In 1981 the computer technology I imagined would have offered the fashion designer the ability to work three dimensionally, to drape, to reverse engineer, and even to animate.

To this day I don't know if the person at the recruitment agency was naïve, or if they were simply doing me a favour and moving me to the next stage of my fashion career. Whichever it was, I thank them for it.

The above experiences are the motivations and the foundations of my explorations into using computer technologies for fashion and then later millinery.

DESIGNING BETWEEN PHYSICAL AND DIGITAL SPACES.

Designing clothes, which most of us wear every day on our bodies, was the starting point of my computer technology focus. With access to 3D Studio Max software via the Dunedin School of Art at Otago Polytechnic, I spent a day every week at the computer, in a small room, with lecturers from computer art, and ceramics, learning through doing, together. We did not follow any set learning, there was a printed manual, but no tutorials. One of my colleagues created geographical flyover modelling of the Otago Peninsula, and another created ceramic pots, and I attempted to make digital fashion.

One of the first pieces I created was a skirt. I drew on my experiences as a fashion designer, patternmaker and fashion maker in the physical world. The image to follow shows a skirt that follows conventions of skirts, created using 3D Studio Max.

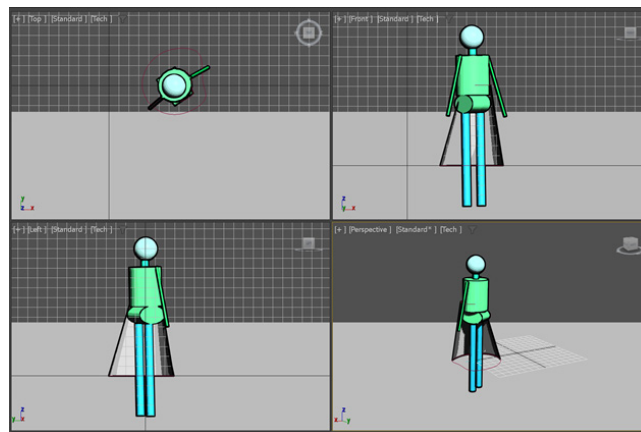


Figure 1: Person and skirt created in 3D Studio Max (now 3ds Max), 2001.

I constantly moved between physical and computer spaces in my designing practice. I had my eyes on the three dimensionality of a fashion product, investigating the physical world and digital worlds to gain understandings of both.

Making with light

I wanted to design and make fashion and strived to create physical outputs of digital fashions. One way was through projections.



Figure 2: two-dimensional computer drawing projected onto cardboard cylinder, 2001.

To enable an embodied three dimensional sketching experience I used an early version of Adobe Photoshop, and created images that were projected onto a cylindrical form from multiple viewpoints. While quite rudimentary, at the time there was a magical quality, made with light, viewed in the dark. They were ethereal objects, that had the illusion of materiality, but did not exist as materiality as I understood.

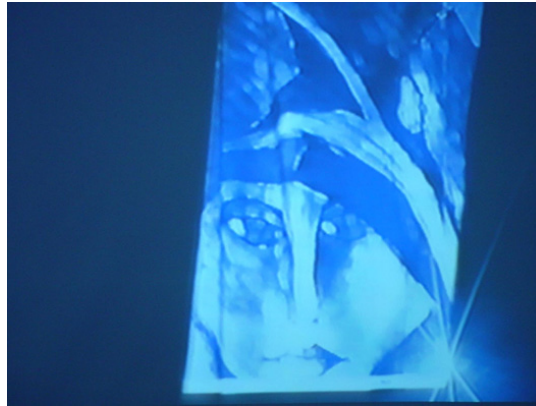


Figure 3: two-dimensional hand drawing of head and hat projected onto fabric cylinder, 2002.

Trying to understand the three dimensionality of garment, of a human, led me to unwrap and then to manually sketch an unwrapped head and hat, which I then projected onto multiple forms.

I was concerned that there were no fashion items, I reflected on the tale of The Emperor's New Clothes (Hans Christian Andersen, 1837), it wasn't my ambition to deceive anyone, I wanted to find a way to sketch, design and make in three dimensions, using a computer.

At this point I focused my investigations on millinery rather than clothes. I realized that the fashion thing I was making was irrelevant, the important element was the process.

Artificial Elegance

In the early 2000's the computer screen was a cube, not flat, it had a dioramic quality to it, it was a three-dimensional artifice. When I sketched in three dimensions using the computer, I felt like I was working in the computer, even though there was no physical connection between my hand and the digital material, and no tactile feedback or resistance. I was lured into the illusion, I could imagine the three dimensionality within the computer 'box'. I felt that if I could put my hand inside the computer screen, that I could touch the small fashion object that hung there, in space, defying gravity.

I wanted to touch this computer object.

To mimic the hat hanging magically in a digital world, I created a public installation – Artificial Elegance - which included The Sketching Machine. In The Sketching Machine I implied the computer 'box' by placing a plinth below a three-dimensional physical sketch of a hat. The hat was 'sketched' in embroidered crinoline, a traditional millinery material, and suspended from the ceiling using transparent nylon line. It was as if the hat was suspended on physical interpretation of the x, y and Z axis.



Figure 4: three-dimensional physical Sketching Machine, from Artificial Elegance, 2004

Along with this were a series of digital three-dimensional sketches of millinery, called Artificial Elegance, which were made and animated in 3D Studio Max.



Figure 5: Three 3D Studio Max stills from an animation, Artificial Elegance, 2004

The digital hats looked perfectly viable wearable millinery pieces, that could be worn in the physical world, but on close inspection, they were not. The hats were illusions. When the head turned, the hat wasn't there, it only had a front, or a side, or a top, or a back, but never all together. There were fractured pieces of hats, not a hat. Visitors to the Artificial Elegance exhibition were perplexed that there was no hat to wear. Not one.

The Cube

I decided to replicate the computer 'box' as something I could inhabit, and physically replicate the fractured pieces of the hat I had viewed in the computer. This time a room replicated the computer, and multiple fractured pieces of hat were suspended in space, varying viewpoints resulted in varying millinery possibilities. Three dimensional physical sketches offered multiple inspirations and design ideas, like a visual diary I could inhabit.



Figure 6: Still from video, Cube Installation, 2004

The cube installation simulated the computer space in the physical world and utilized the problems I had identified with Artificial Elegance animations as attributes. It was enchanting.

I wondered if I ever would have thought of fractured bits of something coming together in multiple ways physically as an installation, and furthermore, if I had more knowledge of the software and wasn't a beginner, would I have made the lucky mistakes that drove me there in the first place?

EXPERTS AND NOVICES

I was installing, making movies of the installation, and I was using three-dimensional software designed for animators, not designers, and certainly not fashion designers or milliners, or creating them in ways that were intended.

I now understand that my expert status was an influence, as I had twenty plus years designing and making fashion and millinery.

Sudnow (1981) tracked his development from novice to expert as a jazz musician, he practiced, he reached the peak and was a master jazz improviser. But is and should mastery be static? I propose that stepping aside from attaining the pinnacle of mastery and instead, put yourself in the shoes of a novice will transform a practice.

Dreyfus and Dreyfus (1980: p1) referred to Sudnow in their work, and developed their five levels of skill - for people learning a foreign language, learning how to play chess, and learning how to fly - and summarized the implications for training as shown in table 1 below.

Skill level ↙ ↘ Mental function	Novice ↙	Competent ↙	Proficient ↙	Expert ↙	Master ↙
Recollection ↙	Non-situational ↙	Situational ↙	Situational ↙	Situational ↙	Situational ↙
Recognition ↙	Decomposed ↙	Decomposed ↙	Holistic ↙	Holistic ↙	Holistic ↙
Decision ↙	Analytical ↙	Analytical ↙	Analytical ↙	Intuitive ↙	Intuitive ↙
Awareness ↙	Monitoring ↙	Monitoring ↙	Monitoring ↙	Monitoring ↙	Absorbed ↙

Table 1 – Dreyfus and Dreyfus, 1980: p15

Table 1 offers clues to why my explorations using an unknown software, that wasn't fashion specific, was successful for me. Furthermore, when discussing pilots Dreyfus and Dreyfus state when discussing pilots abilities to be intuitive and when needed analytical, (1979: p8) "For the very highest performance, they must unlearn the learning habits which first made their acquisition of proficiency possible."

Benner transposed Dreyfus and Dreyfus' 1980 model of Skill Acquisition and as they stated (1982: p 402) 'generalised [the system] to nursing'. I reflected on how I could translate the novice to expert system as Benner did, and apply it to my practice.

Practice	Three- dimensional softwares				Fashion and millinery
Skill level	Novice	Competent	Proficient	Expert	Master
Mental function					
Recollection	Non-situational	Situational	Situational	Situational	Situational
Recognition	Decomposed	Decomposed	Holistic	Holistic	Holistic
Decision	Analytical	Analytical	Analytical	Intuitive	Intuitive
Awareness	Monitoring	Monitoring	Monitoring	Monitoring	Absorbed

Table 2 – Novice / Competent / Master model of exploration, after Dreyfus and Dreyfus.

At the start of my investigations into three dimensional softwares, I was already masterful in my fashion (clothes) and millinery (headwear) practice, as highlighted above in blue. I was simultaneously working situationally, holistically, intuitively and I was absorbed, as expected for my lengthy practice.

When I was commenced utilizing non fashion software from animation, my practice and my abilities were disrupted. I worked in the pink in table 2 above, often drawing on my situational knowledge of clothes and hats, and also often non-situationally just making things, any things. I returned to novice status, and competent at times, as the new computer world I was working in defied the laws of nature. I couldn't make the digital material do what I wanted it to do, it looked like an item of clothing or like a hat, but it wasn't. It was something else, it couldn't be unpacked in a technical drawing. The fashion (clothing and hats) were like an Escher drawing, physically impossible, it was frustrating.

I should have given myself advice I give to my ākongā (students) –let the let the material be itself – advice I was not following in my digital practice. I tried to force my understanding of existing physical practices and materialities of fashion onto and into my computer practices. I did not understand what digital materials were, or what they could be.

I reflected on how moving between the state of a mastery in my discipline in the real world, was disrupted and then enriched when I consciously and unconsciously at times voyaged between mastery and novice / competent.

CONCLUSION

The above experiments shine an interesting light on how an experts practice can be transformed by using a new experience translating and transitioning as a novice.

The notion of a digital fashion as we now know it was beyond comprehension for most people at the time I commenced this practice led research. I was constantly transitioning from physical to digital and back - environments, materials and fashions (hats and clothes) - and was attempting to translate my expert knowledge of physical fashion and millinery practice into a digital practice. It was only by transitioning into softwares that were not fashion specific that I was forced to leave my knowledge of designing and making fashion in the physical world behind. I was isolated from fashion specific ways of working. I was unable to revert to conventions in fashion and millinery such as the set-in sleeve, the crown and brim of a hat.

I used my status of novice to abandon my mastery, and break rules. Expertness and naivety came together and together undid what I had learned in the past, how I thought about designing and making, and sketching in three

dimensions. I transitioned and translated, my practice and product were both transformed through the transdisciplinary approach.

This was a certain place and time, and even then, I felt fortunate to have been working over the divide between physical and computer fashion practices, and to have had the experiences of transitioning between the two.

I recommend that transitioning outside your discipline can provide impetus to spark creativity and provide new ways of working and viewing the world, and add much richness to the expert designer, and ultimately could be a transformational experience.

This paper discusses using trans-disciplinary computer softwares in a fashion and millinery practice over a series of years. The paper highlights the benefits of crossing boundaries and stepping outside a discipline to take a risk and journey into an unknown, unpredictable way of working, one that could be a post human practice as defined by Pepperell. As we move into different computer environments, such as the rise of Artificial Intelligence there will be other divides to transition, translate and transform. While the results of the designing were novel, and even unusable in a practical fashion sense, the deepening understanding about practice, the disciplines, being a novice and expert concurrently and about learning far outweigh any lack of fashion product.

The unexpected transformed the practice.

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